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ABSTRACT

To determine if dance/movement is an effective method for teaching word analysis skills and to encourage creativity, a study examined 69 students from four kindergarten classrooms and 63 students from three second-grade classrooms. Students in each class were randomly assigned to one of two treatment groups. Treatment 1 groups received a dance/movement program emphasizing word analysis concepts appropriate for the grade level (typically beginning with a physical warm-up, followed by exploration of concepts, and closing with a cool-down). Treatment 2 groups received a lecture and worksheet program teaching the same word analysis concepts. Each session was 30 minutes in length, and students underwent 17 treatment sessions over a 7-week period. After completion of the program, three tests were administered: (1) Torrance Tests of Creative Thinking; (2) Iowa Tests of Basic Skills (ITBS), Form G, Word Analysis section of levels 5 and 8; and (3) Informal Survey of Affect, a five-item questionnaire than involved circling smiley faces arranged in a Likert scale. One month following these tests the ITBS was administered again to provide a measure of word analysis skill retention. Results suggested that dance/movement, when compared to the lecture and worksheet method, was more effective in facilitating learning of word analysis concepts over the short-term, stimulating creativity, and producing a positive affective response. Longer-term cognitive retention effects were not demonstrated to be improved through the use of dance/movement. (Twelve tables of data and 44 references are appended. (MM)

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Teaching Language Skills Using Dance/Movement Methods

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The purpose of the present study was to determine if dance/movement can be an effective method, for teaching skills usually taught in core curriculum, and also for encouraging creativity. Children participated in a dance/movement program and their knowledge of selected word analysis concepts and expressions of creativity were both measured. The children in the dance/movement program were compared to children who were taught in a control group in which selected word analysis concepts through a lecture and worksheet methods.

The term dance/movement refers to what has been called creative dance, educational dance, creative movement, movement education, and movement exploration. While all of these terms may not be synonymous, dance/movement is intended to represent the essential aspects of each (Ludwig, 1979).

Through the years, dance in has become more and more important in schools (Murray, 1963). The integration of the arts into the general curriculum has become a growing trend. The term "general curriculum" refers to the traditional school "basic" subjects such as language arts, math, science, and social studies. The Dance Division Task Force (Fleming, 1973) called for educators to relate dance movement to other curriculum experiences, whenever and wherever appropriate.

An example of an arts program integrated with the general curriculum is the "Dancing Playground" described by Brin (1972). A dance performance was presented to children with concepts such as playground safety and litter prevention as content for choreography. Other programs were Project IMPACT

(Interdisciplinary Model Program in the Arts for Children and Teachers) (Wenner, 1973), "Arts Are Basic" (Mattera, 1980), and Hoover's (1980) use of dance/pantomime to communicate health concepts. Twillie (1980) used creative dance activites with kindergarten children in an attempt to determine if such could enhance readiness and intellectual maturity. However, the study's results were not conclusive.

A typical dance/movement session begins with a physical warm-up, followed by exploration of concepts, and closes with a cool-down. This format is recommended by Joyce (1980). At all times, the basic elements of dance are explored: body, space, force, and time (Joyce, 1980). That is, every dance/movement lesson should have activities that use change and contrast of energy, use of time, and variety in the levels and range of the body in space (Cambigue, 1981).

One of the main features that distinguishes dance/movement from traditional learning media is the gross motor activity of the children. The gross motor activities of the body are used to convey ideas, express feelings, and present images from the mind (Cambigue, 1981).

Theoretical and Empirical Framework

The extent that cognitive and motor functions are related has been a controversial and unresolved issue (Rarick, 1980). Some theorists, such as Kephart (1960), propose that motor experiences have a facilitating effect on cognitive functioning and on academic achievement of children. Kephart has suggested a model of motor training that is designed to ameliorate

children's perceptual-motor difficulties, thus allowing them to progress satisfactorily in academic skills development. The evidence supporting the use of such a program is far from conclusive. However, evidence suggests that a small positive relationship exists between cognitive and motor functioning (Chissom, 1971; Cobb, Chissom, & Davis, 1975; Harris & Jones, 1982; Ismail, Kane, & Kirkendall, 1969). Other researchers (Humphrey, 1965, 1967, 1969; Nelson, 1976; Penman, Christopher, & Wood, 1977) have concluded that directly pairing physical activity with cognitive activity produced a facilitating effect. Thus, motor activities may facilitate academic learning, not necessarily directly through a motor training program, but rather by the juxtaposition of cognitive and motor functions.

Physical movement as an aid to learning is consistent with Piaget's theories of cognitive development (Gilbert, 1979). Piaget's theories are concerned with how a child's thoughts develop from physical manipulations and interactions with the environment (Lorton & Lorton, 1984). Current brain research is consistent with Piaget's theories and suggests how the use of motor experiences may facilitate cognitive learning. The left and right hemispheres of the brain have different functions. The left side is verbal, analytical, and sequential, and particularly suited to traditional instructional methods: lecture, fill-in-the-blanks, etc. The right hemisphere is holistic and spatially oriented. The right side is the creative side of the brain and is stimulated by the arts and movement (Kane & Kane, 1979). Dance/movement is particularly suited to

right sided functions.

The significance of brain research is that truly effective and efficient learning may be the result of an individual adequately using both hemispheres of the brain. As dance/movement should stimulate the right hemisphere, such activities should be an excellent complement to the left hemisphere oriented traditional methods of teaching. Thus, an integration of both hemispheres as a result of participation in dance/movement should facilitate learning.

Additionally, the predominant styles of the right hemisphere are creative (Rubenzer, 1979). Galin (1976) described creativity as a product of two highly developed hemispheres that work together in a complementary fashion. Torrance (1970) found that creative movement experiences increase creativity scores. Thus, dance/movement should be an effective method for stimulating an individual's creative abilities.

Selection of General Curriculum Skills

For the purposes of the present study dance/movement was integrated with word analysis skills. Word analysis skills are decoding skills that require knowledge of grapheme-phoneme relationships and the ability to use phonetic and word structure analysis skills (Hieronymus, Hoover, & Lindquist, 1986). According to Leu and Kinzer (1987), decoding is the process used by readers to determine the oral equivalent, or pronunciation, of a written word. Decoding knowledge can be classified into five types: the ability to use context, phonic, word structure,

and dictionary information, as well as words memorized by sight. Of particular interest in the present study was phonic knowledge, which Leu and Kinzer describe as a reader's understanding of letter-sound relationships and the ability to put together, or blend, sounds represented by letters. The relationships between letters and sounds are sometimes called grapheme-phoneme relationships.

Leu and Kinzer (1987) present a model of a deductive phonics lesson. First, the teacher states a phonics generalization. Second, the teacher or the students read words illustrative of the phonics generalization. Third, the teacher leads the children in guided practice. Fourth, the students complete a task independently to practice use of the generalization. Spache and Spache (1986) present similar steps in teaching a phonic element. They suggest extending reinforcement through the use of teacher-made or commercial worksheets. The worksheets should have activities such as answering riddles with a word containing a certain sound, supplying missing words in a sentence with a word containing a particular sound, circling words in a given list, drawing a picture whose name illustrates a sound, and others. The deductive method of teaching phonics knowledge in the present study followed the model described by Leu and Kinzer and employed worksheets such as described by Spache and Spache for reinforcement.

Method

Subjects

Subjects were drawn from four kindergarten classrooms and three second grade classrooms in a school with a predominantly middle-class clientele. The students attending this school tend to be of average intellectual functioning. The sample originally consisted of 152 children who participated in the treatment. Of that number, 132 children were available for all of the occasions of testing. Of this sample, 69 were kindergarteners and 63 were second graders. The group receiving the dance/movement treatment included 35 kindergarteners and 33 second graders. The lecture and worksheet group included 34 kindergarteners and 30 second graders. The entire sample was evenly divided by sex, with 66 boys and 66 girls. Age range was from five to nine years. Table 1 summarizes the characteristics of the sample.

Treatment

Treatment I kindergarten groups received a dance/movement program emphasizing word analysis concepts appropriate for the grade level. Treatment I second grade groups also received a dance/movement program, also emphasizing word analysis concepts appropriate for the grade level. Treatment II groups in both kindergarten and second grade received a lecture and worksheet program; the lessons taught the same word analysis concepts as the kindergarten and second grade Treatment I groups.

Each Treatment I dance/movement session began with a warm-up, followed by exploration of word analysis concepts integrated with movement activties, and closed with a cool-down. The lecture and worksheet treatment utilized what Bruner (1970)

calls a direct or expository teaching style. The student is the listener and the teacher controls the pace and style of exposition. Each Treatment II session began with the viewing of an experimenter-prepared videotaped lesson. Each videotaped lesson was approximately 15 minutes in length. The videotaped lesson featured a teacher, the experimenter, lecturing about word analysis concepts.

Importantly, the videotape format insured uniformity of presentation for all Treatment II groups. The videotape format also helped to prevent incidental events from threatening uniformity of treatment. After viewing the videotape, students completed a paper and pencil activity on worksheets that reinforced the concept presented in the videotaped lecture. The worksheets consisted of fill-in-the-blank, matching, copying, circling, or coloring type items. The worksheet was completed during the last half of each session.

Procedure

The students in each class were randomly assigned to either of the two treatment conditions. This assignment resulted in two approximately equal groups of about 10 children in each of the four kindergarten treatment groups and two approximately equal groups of about 12 children in each of the three second grade treatment groups. This resulted in a total of seven groups. This feature of the design is presented in Table 2. Subjects underwent 17 treatment sessions over a seven week period. Each seession was 30 minutes in length. Treatment I and Treatment II sessions were simultaneous for each classsroom

grouping.

After the completion of Treatments I and II, the following tests were administered to all children:

Torrance Tests of Creative Thinking, Figural Tests, Form A (TTCT);

Iowa Tests of Basic Skills, Form G, Word Analysis section of Levels 5 and 8 (ITBS); and

Informal Survey of Affect (ISA).

The Informal Survey of Affect is a five item questionnaire prepared by the experimenter that involves circling smiley faces arranged in a Likert scale. The child circles the face that most represents how he or she feels about the treatment as described by the item. Each treatment group received the same questionnaire with the exception of the substitution of the name of their treatment in each item.

After completion of Treatments I and II and after a one month lapse of time, the ITBS was again administered. This provided a measure of retention over time of the word analysis skills. Some researchers fail to investigate this important aspect of intervention effects.

The experimenter conducted Treatment I for each kindergarten and second grade group. As the experimenter was the dance/movement teacher and also the teacher in the video-taped lessons, the experimenter effectively was the teacher for both treatment groups. A trained assistant, a graduate student, was in charge of monitoring the children while operating the videotape equipment and distributing the

worksheets for the Treatment II groups in the regular classrooms.

Results

Preliminary Reliability Analysis

Reliability is a function of data collected from given individuals using given variables at given points in time (Webber, Thompson & Berenson, 1986), and not of a test per se. Thus, tests are not themselves reliable or valid. It is incumbent upon the researcher to demonstrate that a test yields reliable data in a given application.

Therefore, reliability of the data from the ITBS was evaluated. Cronbach's alpha was used to estimate the reliability coefficients. For the kindergarten subjects, on the posttest and the follow-up ITBS posttest, the reliability coefficients were .84 and .85, respectively. For the second grade subjects, the reliability coefficients for the posttest and the follow-up posttest were .77 and .82, respectively. These data are presented in Table 3.

Reliability of the ISA was also estimated with Cronbach's alpha. The reliability coefficent was .79. Table 4 presents corrected item-total correlation coefficients and other results produced from the analysis.

The TTCT was scored using the recommended scoring procedure (Torrance & Ball, 1984). One scorer, the experimenter, scored tests from all subjects, and another scorer, a graduate student, scored the tests from a randomly selected group of 49 subjects. The interrater reliability was determined by the Pearson

correlation procedure. The TTCT yields six scores: fluency, originality, elaboration, abstractness of titles, resistance to premature closure, and the creativity index. Table 5 presents the interrater reliability coefficients for these scores.

Factor Analysis

Factor-analytic techniques allow researchers to see whether an underlying pattern of relationships exists such that the data may be reduced to a smaller set of factors or components (Nie, Hull, Jenkins, Steinbrenner, & Brent, 1975). Furthermore, factor analysis condenses variables into fewer scores that tend to be "built" only from the reliable components of the original variables (Thompson, 1982). Thus, principal components analysis was performed separately on the TTCT data from each of the two scorers. It is noteworthy that conducting two separate analyses served as a cross-validation or test of invariance or stability of the results. The creativity index scores were not included in the analysis, since this score is derived from the other scores.

According to the eigenvalues, two orthogonal factors underlie the TTCT scores. Using the data from the primary scorer, the eigenvalue for the first factor prior to rotation was 2.12 and the eigenvalue for the second factor was 1.15. The data from the secondary scorer resulted in an eigenvalue of 2.15 for the first factor and an eigenvalue of 1.29 for the second factor.

The varimax method of rotation was used to clarify factor structure, which is presented in Table 6. Table 6 also presents

the communalities denoting the proportion of variance of each variable that was retained somewhere in the factor structure. The results involving data from both raters are presented. The results wre considered adequately cross-validated.

Factor I involved most of the TTCT scores as indicated by the structure correlation coefficients presented in Table 6. The factor was labeled "General Creativity". Factor II from both analyses primarily involved high abstractness and low fluency. Persons who score high on this factor sacrifice quantity of production, i.e., fluency, in service of generating more abstraction. The factor was labeled "Creativity in Abstraction". The comparability of results across raters suggests that the raters were consistent and the factors stable.

Next, factor scores were computed for each subject on each of the identified factors from the primary rater's data. Several methods are available for computing scores on factors, known as factor scores. A popular method is the least squares regression procedure which requires the computation of standard scores for each variable which are then multiplied by factor weighting coefficients. This method converts all factor score means to zero, which is not acceptable if comparisons among the means across factors are of research interest. Another factor score estimation procedure that remains within the least-squares tradition involves a transform of the raw data to a form in which each variable has a standard deviation of one, but the means are not altered. This non-centered score estimation procedure is of interest whenever comparison of averages across

factors is a primary focus of factor analytic research (Thompson, 1983).

As a preface to conducting MANOVA to explore immediate intervention effects, non-centered factor scores were calculated using the data from the primary rater. The mean of the factor scores created on the first factor was 8.46 with a standard deviation of 1.00. The mean of the factor scores created on the second factor was 2.40 with a standard deviation of 1.00.

Test of Immediate Intervention Effects

As a test of the immediate intervention effects, a MANOVA was run with the first posttest ITBS word analysis normal curve equivalent (NCE) scores, the ISA total score, and the two sets of factor scores derived from the TTCT data as dependent variables. It is important to note that NCE scores were used to put the scores from the two grade levels into a common metric so that they could be compared without bias. The subjects were grouped by grade and treatment condition. Table 7 presents the descriptive statistics for the analysis. Table 8 presents the MANOVA keyout table.

Post Hoc Analyses for Immediate Effects

If MANOVA yields a statistically significant result, then there is some non-chance association between an independent variable and the dependent variables. Discriminant analysis may be used to characterize the major differences among the groups used in MANOVA. The differences are revealed through the discriminant functions. The structure matrix offers information as to which variables are associated with a function. The

structure coefficients are particularly useful because they are correlations between the dependent variables and each set of discriminating function scores. The variables that are highly correlated with a function are primarily responsible for the separation among the groups in a given function (Heausler, 1987).

According to the MANOVA results, there was non-chance association between grade level and the dependent variables, so discriminant analysis was performed with grade levels as groups. Table 9 lists the function and structure coefficents. A statistically significant relation between treatment condition and the dependent variables was also demonstrated with MANOVA, so discriminant analysis was again performed with treatment conditions as groups. Table 10 lists function and structure coefficients.

Test of Delayed Effects

Repeated measures ANOVA with the ITBS NCE scores from the two occasions of testing was conducted to test for delayed effects. A critical assumption of this method is that the variances and covariances of the dependent variables remain comparable across repeated measurement. A chi-square test (8.99, $df = 9$, $p = .44$) indicated that this assumption was met in the present study. Descriptive statistics for these analyses are presented in Table 11 and the repeated measures ANOVA keyout is presented in Table 12.

Discussion

The results from the present study suggest that

dance/movement can be a valuable and effective method. Dance/movement, when compared to a lecture and worksheet method, was more effective in facilitating learning of word analysis concepts over the short-term, stimulating creativity, and especially producing a positive affective response. Longer-term cognitive retention effects were not demonstrated to be improved through the use of dance/movement, but this may have been an artifact of experimental duration.

The structure coefficients reported in Table 10 suggest that the treatment intervention differentially affects the four dependent variables. The effect sizes for the dependent variables complement these analyses and can be used to order the dependent variables with respect to their susceptibility to treatment influence. These effect sizes are like *z* scores and are computed by subtracting the control group mean from the treatment group mean and then dividing by the control group standard deviation. In order of susceptibility to this influence, the effect sizes for the variables are: (1) 0.44 for affective reaction; (2) 0.30 for Factor II, "Creativity in Abstraction"; (3) 0.16 for Factor I, "General Creativity",; and (4) 0.07 for the NCE word analysis scores.

In short, although the dependent variables differed in their susceptibility to treatment influence, it is noteworthy that all effect sizes favored the experimental dance/movement group. Thus, the statistically significant treatment effect was produced by the aggregate of this pattern of differences in means.

The treatment effect, as determined through post hoc discriminant analysis, was higher for the second grade level than for the kindergarten grade level. That is, dance/movement appeared to be more effective for second graders than for kindergarteners in facilitating learning. This result is consistent with Piaget's (1952) theories of cognitive development. Also, the increased brain integration of the second graders may account for the differences between the two grade levels.

While not a primary concern of the present study, the children's affective response to the treatment (see Table 7) is of interest. Motivation and enjoyment are often considered a positive benefit of participation in dance/movement activities (Bloom & Remer, 1976; Nadon & Van Allen, 1974; Wenner, 1973; Werner, 1981). The statistically significant treatment effect revealed through the MANOVA, when further studied through discriminant analysis, involved several variables but was somewhat more associated with the ISA dependent variable. The structure coefficient for this variable, as noted in Table 10, was .83. The effect size derived from Table 7 was 0.44 ((8.63 - 7.41)/2.72). This is considered a large effect size. Thus, it appears that the affective response to the dance/movement treatment was much more positive than the affective response to the lecture and worksheet treatment. It is noteworthy that similar results have been reported for process oriented interventions in other disciplines, such as science education (Welch & Walberg, 1974).

The results of the present study have implications for teachers of beginning reading. Dance/movement has elements that are consistent with the bases of the whole language approach as described by Goodman (1986). The whole language approach requires teachers and students to look at aspects of language only in the context of the real language experiences of the children. In dance/movement, the emphasis is on the meaning of the words used to describe the movement situation, yet the systematic presentation allows for children to notice the phonic generalizations. The whole language approach calls for teachers to guide, support, monitor, encourage, and facilitate learning, as teachers do in dance/movement. In contrast, lecture and worksheet lessons were systematic and controlled by the teacher. Also, the deductive method used in the lecture and worksheet condition involved isolating phonic generalizations without emphasizing meaningful context.

The results of the present study also support the use of the problem solving approach. This approach may also be described as the hypothetical mode of teaching style (Bruner, 1970) or the indirect teaching style (Zaichkowsky, Zaichkowsky, & Martinek, 1980). The problem solving approach has the teacher encouraging learning through discovery as opposed to the teacher controlling all conditions related to learning. Problem-solving is an integral part of dance/movement but not of the lecture and worksheet method. The results of the present study suggest that beginning reading instruction should include problem-solving and meaningful situations for teaching aspects of language.

Future research on the effects of dance/movement is recommended. Such research should involve repeating studies of this type with with a longer duration of treatment, with students of various socioeconomic status, with concepts drawn from the general curriculum other than word analysis concepts, and with various types of control groups in various combinations.

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Table 1
Description of Sample

Sample Characteristic	N
Grade	
Kindergarten	69
Second	63
Sex	
Male	66
Female	66
Age (Mean 6.43, SD 1.29)	
Five	47
Six	23
Seven	24
Eight	34
Nine	4
Dance/movement	
Kindergarten	35
Second	33
Total	68
Lecture and Worksheet	
Kindergarten	34
Second	30
Total	64
Total Sample	132

Table 2
Numbers of Subjects in Each Group

Class	Treatment I Dance/movement	Treatment II Lecture and Worksheet	Totals
K-1	10	11	21
K-2	9	8	17
K-3	10	9	19
K-4	10	11	21
2-1	12	12	24
2-2	13	12	25
2-3	12	13	25
Totals	76	76	152

Table 3
Reliability of the ITBS

Grade	Test Occasion	Reliability
K	Posttest	.84
K	Follow-up	.85
2	Posttest	.77
2	Follow-up	.82

Table 4
ISA Item-Total Reliability

Item	Corrected Item-Total Correlation	Alpha if Item Deleted
1	.70	.70
2	.56	.75
3	.53	.76
4	.48	.78
5	.62	.73

Table 5
Interrater Reliability for TTCT

Scoring Variable	Reliability
Fluency	.91
Originality	.79
Abstractness of Titles	.56
Elaboration	.82
Resistance to Premature Closure	.74
Creativity Index	.71

Table 6
Rotated Factor Structure of TTCT

Variable	Factor I	Factor II	Communality
Rater 1			
Originality	.84	-.25	.76
Elaboration	.72	.39	.68
Resistance to Premature Closure	.70	.12	.50
Fluency	.63	-.48	.63
Abstractness of Titles	.06	.83	.70
Eigenvalues	2.11	1.15	
Rater 2			
Elaboration	.88	.18	.81
Originality	.77	-.24	.65
Resistance to Premature Closure	.75	-.18	.59
Abstractness of Titles	.09	.86	.82
Fluency	.30	-.74	.64
Eigenvalues	2.03	1.41	

Note. The eigenvalues reported in the trace are the eigenvalues after rotation.

Table 7
Descriptive Statistics

Dependent Variable	Grade	Treatment	Mean	SD
TTCT Factor I	K	Combined	8.84	.90
	2	Combined	8.04	.94
	Combined	D/M	8.54	.97
	Combined	L&W	8.37	1.03
	K	D/M	8.95	.83
	K	L&W	8.72	.97
	2	D/M	8.10	.92
	2	L&W	7.98	.98
	Entire Sample		8.46	1.00
TTCT Factor II	K	Combined	2.04	.86
	2	Combined	2.79	.99
	Combined	D/M	2.53	1.09
	Combined	L&W	2.26	.89
	K	D/M	2.25	.97
	K	L&W	1.82	.68
	2	D/M	2.83	1.15
	2	L&W	2.75	.81
	Entire Sample		2.40	1.00
ITBS	K	Combined	49.64	17.36
	2	Combined	55.19	17.24
	Combined	D/M	52.85	17.53
	Combined	L&W	51.69	17.50
	K	D/M	48.74	17.52
	K	L&W	50.56	17.40
	2	D/M	57.21	16.70
	2	L&W	52.97	17.83
	Entire Sample		52.29	17.46
ISA	K	Combined	8.54	1.84
	2	Combined	7.49	2.86
	Combined	D/M	8.63	1.98
	Combined	L&W	7.41	2.72
	K	D/M	8.94	1.33
	K	L&W	8.12	2.20
	2	D/M	8.30	2.47
	2	L&W	6.60	3.05
	Entire Sample		8.04	2.44

Note. D/M = Dance/movement; L&W = Lecture and Worksheet.

Table 8
MANOVA for Immediate Effects

Source	F	df	p	Effect Size
Treatment	3.26	4/125	.01	9.4%
Grade	17.49	4/125	<.001	35.9%
Treatment by Grade	.81	4/125	.52	2.5%

Note. Effect size is (1 - lambda) * 100, a direct analog to the coefficient of determination.

Table 9
Post Hoc Discriminant Analysis for Grade Effect

Variable	Function Coefficient	Structure Coefficient
TTCT Factor I	.74	.58
TTCT Factor II	-.67	-.55
ISA	.42	.30
ITBS	-.36	-.22

Table 10
Post Hoc Discriminant Analysis for Treatment Effect

Variable	Function Coefficient	Structure Coefficient
ISA	.89	.83
TTCT Factor II	.53	.44
TTCT Factor I	.20	.27
ITBS	-.21	.11

Table 11
Descriptive Statistics for Delayed Effects

Grade	Treatment	Mean	SD
ITBS First Occasion			
K	Combined	49.64	17.36
2	Combined	55.19	17.24
Combined	D/M	52.85	17.53
Combined	L&W	51.69	17.50
K	D/M	48.74	17.52
K	L&W	50.56	17.40
2	D/M	57.21	16.70
2	L&W	52.97	17.83
Entire Sample		52.29	17.46
ITBS Second Occasion			
K	Combined	54.75	19.02
2	Combined	63.49	18.99
Combined	D/M	57.96	21.08
Combined	L&W	59.95	17.63
K	D/M	51.57	19.73
K	L&W	58.03	17.97
2	D/M	64.73	20.61
2	L&W	62.13	17.28
Entire Sample		58.92	19.43

Table 12
ANOVA for Delayed Effects

Source	SOS	df	MS	F	p	Effect Size
Between Subjects Effects						
Treatment	8.46	1	8.46	.01	.90	0.00%
Grade	3254.75	1	3254.75	5.71	.02	0.04%
Treatment by Grade	939.05	1	939.05	1.65	.20	0.01%
Subjects	72934.18	128	569.80			
Within Subjects Effects						
Time	2992.83	1	2992.83	32.53	<.001	25.42%
Grade by Time	167.48	1	167.48	1.82	.18	1.42%
Treatment by Time	162.84	1	162.84	1.77	.19	1.38%
Grade by Treatment by Time	36.77	1	36.77	.40	.53	0.31%
Error	11774.93	128	91.99			